Name: Date:

Polynomial Factoring solution (version 678)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 6x + 33 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(33)}}{2(1)}$$

$$x = \frac{-(-6) \pm \sqrt{36 - 132}}{2(1)}$$

$$x = \frac{6 \pm \sqrt{-96}}{2}$$

$$x = \frac{6 \pm \sqrt{-16 \cdot 6}}{2}$$

$$x = \frac{6 \pm 4\sqrt{6}\, i}{2}$$

$$x = 3 \pm 2\sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $6 + 2i$ and $7 + 4i$ in standard form ($a + bi$).**

Solution

$$(6 + 2i) \cdot (7 + 4i)$$

$$42 + 24i + 14i + 8i^2$$

$$42 + 24i + 14i - 8$$

$$42 - 8 + 24i + 14i$$

$$34 + 38i$$

Polynomial Factoring solution (version 678)

3. **Write function $f(x) = x^3 + 7x^2 - 6x - 72$ in factored form. I'll give you a hint: one factor is $(x - 3)$.**

Solution

	1	7	-6	-72
3		3	30	72
	1	10	24	0

$$f(x) = (x - 3)(x^2 + 10x + 24)$$

$$f(x) = (x - 3)(x + 6)(x + 4)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x + 1)^2 \cdot (x - 4) \cdot (x - 7)$$

Sketch a graph of polynomial $y = p(x)$.